Example Industrial Engineering Capstone Design Projects

Delivery Operation Analysis – United Parcel Service (Spring 2003)

The team evaluated and analyzed methods to improve dispatching of Saturday deliveries for UPS in Oklahoma City, within the constraints of aircraft arrival and delivery time commitments. The team recommended implementation of Geographic Information System (GIS) software in the main plant in order to create optimal routes to be followed by drivers. Payback is accomplished in less than one year of operation.

Warehouse Picking Pattern Optimization – Regional Food Bank (Spring 2004)

The team was asked to redesign the alignment of the warehouse picking slot pattern for stocked items in order to increase productivity, reduce forklift travel time, reduce replenishment time and reduce damage of picked product. An ABC inventory analysis was applied, and a new warehouse configuration defined. In the new configuration, productivity was increased by 87% and average travel time reduced by 46%.

Electronic Database for Job Evaluation – General Motors (Spring 2004)

The team created a user-friendly electronic database for storing job evaluation forms, with flexible graphical output, using Visual Basic and Excel. Usability tests were run using GM employees to test the functionality.

Methods for Reducing Employee Injuries – Eaton Corporation (Spring 2004)

The team studied the flywheel machining area of the clutch manufacturing plant where the company had experienced a high number of employee injuries. They identified the root cause of the injuries and offered a number of possible solutions, with cost analysis of each.

Improvements to Dispatch Planning System – United Parcel Service (Spring 2005)

UPS had implemented a new Dispatch Planning System which used a geographic map interface. The team studied the portion of the system that dispatched to the University of Oklahoma Campus and provided information about the campus for input to the system that allowed improvements in the number of stops per road hour. The methodology was documented to allow UPS to apply this work to other locations.

Non-Value Added Time Analysis – General Motors (Spring 2005)

An analysis of the Chassis Assembly department was performed with the goal of reducing non-value added time. Major focus was place on reducing line stoppages due to material shortages at individual workstations. Material storage locations were analyzed and recommendations on pack resizing were made.